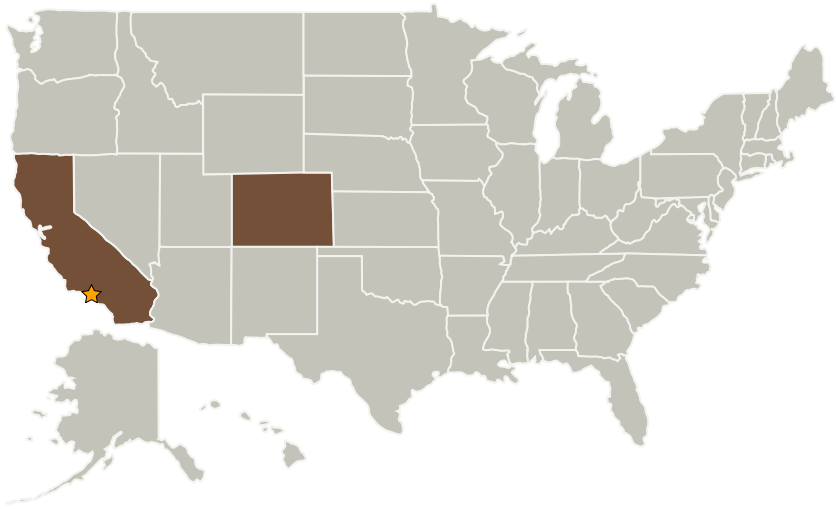
A Miniaturized and Robust FTS Sensor, Phase II

Completed Technology Project (2004 - 2006)

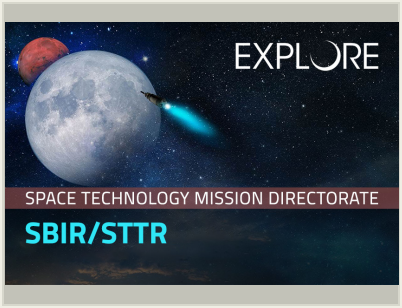
Project Introduction

Vescent Photonics determined the feasibility of a miniaturized, robust, Fourier transform spectrometer (FTS) for either in-situ or remote chemical and spectral analysis. During this phase I effort we investigated innovative, optical waveguide technology, capable of providing an unprecedented, entirely electro-optic replacement for millimeter or even centimeter scale mechanical mirror translation. This technology, developed by Vescent Photonics, enables a fully integrated FTS chemical sensor unit. The attributes of this sensor: i) small size, comparable to a book of matches, ii) low mass, only tens of grams, iii) small energy consumption, < 10-3 Watt-hours per measurement, iv) high sensitivity, detectable chemical densities < 1013 per cm3, and v) robust monolithic construction, are aptly suited for future NASA missions. Such a sensor can be integrated and deployed with a variety of exploration platforms. A single device will provide identification and quantification of multiple compounds (e.g., biogenically important CH4, NOx, NH3, H2O, and many more).

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Vescent Photonics, Inc.	Supporting Organization	Industry	Arvada, Colorado



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
California	Colorado

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves